7. MIXTURES, WASTES WITH OVERLAPPING REQUIREMENTS, RESIDUES, AND LEACHATES

Chapters 4, 5, and 6 dealt with wastes that clearly fall under the definitions of spent solvents, dioxins, California list wastes and first-third wastes. Unfortunately, the real world has many wastes that do not fall into these clear-cut categories. This chapter discusses how four less-well-categorized types of wastes are handled under the land disposal restrictions: mixtures, wastes with overlapping requirements, residues, and leachates.

MIXTURES

The land disposal restrictions become complicated when wastes containing more than one regulated constituent are involved. However, in most cases, the complications can be resolved by applying the following rule: constituent-specific standards and effective dates take precedence over generic standards and effective dates. The following examples clarify this procedure.

Halogenated Spent Solvent Mixtures

Halogenated spent solvents are subject to land disposal restrictions under two sets of regulations: 1) the spent solvent restrictions, and 2) the California list HOC restrictions. However, if a treatment standard has been specified for an individual chemical, it takes precedence over the generic HOC standard.

For example, Table 4.1 gives the treatment standard for spent carbon tetrachloride as 0.96 mg/L. By comparison, the general California list restrictions establish a maximum HOC concentration of 1,000 mg/L total HOCs prior to land disposal. Since a chemical-specific treatment standard has been developed for spent carbon tetrachloride under the spent solvent rule, this treatment standard supersedes the California list standard. Similarly, the effective date for the spent solvent restriction (November 7, 1986) applies rather than the effective date for the HOC restriction (November 8, 1988).

In another example, wastewater that is hazardous because it contains spent halogenated solvents (Hazardous Wastes Nos. F001–F005) falls under the spent solvent prohibitions rather than the California list HOC prohibitions. Since a two-year variance was issued for wastewaters containing spent solvents, these wastes are not prohibited from land disposal until November 8, 1988.

Finally, if a waste contains spent halogenated solvents as well as other HOCs, the spent solvent prohibitions are used exclusively to determine how the wastes must be managed. EPA gives the following examples:

- Generator A generates a liquid hazardous waste containing 2,000 mg/L HOCs, some of which are F001 spent solvents. The waste must meet the waste-specific treatment standards for F001 spent solvents and must also comply with the effective date for these solvents. Hence, because a two-year capacity variance was given to wastes containing <1% F001–F005 wastes, the effective date in this example is November 8, 1988. Table 3.2 identifies the requirements that must be met during the time a capacity variance is in effect.
- A small quantity generator (100–1,000 kg of wastes/month) generates a waste containing 20,000 ppm of F001 spent solvents and 25,000 ppm of other HOCs. The treatment standards for F001 spent solvents are controlling. In this case, a two-year capacity variance was given to this type of spent solvent from small quantity generators. Therefore, the wastes will not have to meet the spent solvent treatment standards until November 8, 1988.
- The same waste as in the previous example is produced by a large quantity generator (>1,000 kg of wastes/month). The spent solvent prohibitions still control. In this case, the waste will have to meet the spent solvent treatment standards (Table 4.1) effective November 7, 1986.

PCB Mixtures

Because PCBs are also halogenated organic compounds, a regulatory overlap can occur. EPA cites the following example for PCB wastes:

> "The limitation of 50 ppm is only applicable to *liquid* hazardous wastes containing PCBs. Therefore, a nonliquid hazardous waste containing PCBs at concentrations greater than or equal to 50 ppm may be land disposed without violating the California list PCB prohibition on HOCs as long as the total concentration of HOCs does not exceed 1,000 mg/kg. For example, a nonliquid hazardous waste containing 200 mg/kg (ppm) PCBs and 700 mg/kg other HOCs may be land disposed because the 50 ppm prohibition does not apply to nonliquids and because the 900 mg/kg total HOC concentration does not exceed the 1,000 mg/kg threshold. . . . If the total concentration of HOCs in either a liquid or nonliquid hazardous waste is greater than or equal to 1,000 mg/kg, the waste is prohibited from land disposal even if the concentration of PCBs is below 50 ppm. ... Also, a nonliquid hazardous

waste containing 400 mg/kg (ppm) PCBs and 700 mg/kg HOCs other than PCBs is prohibited from land disposal despite the fact that existing regulations promulgated under TSCA would allow such nonliquid PCB wastes to be disposed in an approved landfill."

Mixtures of Different Constituent Types

Where different types of constituents (e.g., heavy metals and HOCs) are present in the same waste, all of the constituents must be in compliance with all specified treatment standards or prohibition levels. For example, a mixture containing both HOCs and a liquid heavy metal waste would be prohibited from land disposal until it is in compliance with the treatment standard for HOCs and the prohibition levels for heavy metals.

Similarly, the effective date for each constituent would be applicable. Thus, for a liquid hazardous waste containing metals and HOCs ≥ 10,000 mg/L, the July 8, 1987 prohibition date applies to the metals, while the November 8, 1988 prohibition date applies to the HOC constituents. (Table 5.3 summarized the effective dates applicable to the various California list wastes.)

Radioactive Mixtures Reclassified

Special consideration has been given to mixtures of radioactive wastes and first-third hazardous wastes – any such mixture has now been reclassified as a third-third waste. Therefore, these mixtures will not be prohibited from land disposal until May 8, 1990. (Note that mixtures of radioactive wastes with spent solvents, dioxins, or California list wastes remain subject to the applicable treatment standards for these wastes.)

Lab Packs

Lab packs are a special type of waste mixture. The lab pack typically consists of a drum or container filled with many smaller containers of chemicals. Chemicals in these smaller containers may be subject to a variety of land disposal restrictions.

If a lab pack contains restricted wastes, the entire lab pack is subject to the land disposal restrictions. Therefore, any wastes subject to the restrictions should be segregated from other nonrestricted wastes. Restricted wastes in a lab pack must either meet the treatment standards or be disposed in a unit that has been granted a no-migration exemption.

Contaminated Soil and Debris

Contaminated soil and debris can also be considered a special type of waste mixture. These wastes are subject to the same restrictions as any other waste covered by the land disposal restrictions. For example, soil contaminated with spent solvents is subject to the land disposal restrictions for spent solvents. However, because a shortage exists in treatment capacity available to treat soil and debris, a complex set of effective dates has been established for these wastes – see Table 7.1.

Logic Diagram for Handling Mixtures

The procedures to use in dealing with mixtures of hazardous wastes subject to different land disposal restrictions are summarized in Figure 14 of Chapter 3.

WASTES WITH OVERLAPPING REQUIREMENTS

Some wastes may be subject to more than one regulatory requirement because they fall into different categories. This typically occurs where a waste is covered by name under one set of regulations and is also covered by another set of generic regulations such as those applicable to California list wastes. The most likely source of this overlap occurs between first-third wastes and California list wastes.

TABLE 7.1
SUMMARY OF EFFECTIVE DATES APPLICABLE TO WASTE-CONTAMINATED SOILS AND DEBRIS

Restricted hazardous waste	Prohibition effective date
Solvent- and dioxin-containing soil and debris from CERCLA response or RCRA corrective actions	11-8-90
Soil and debris *not* from CERCLA response actions or RCRA corrective actions contaminated with less than 1% total solvents or certain dioxins	11-8-88
Soil and debris contaminated with California list HOCs from CERCLA response actions or RCRA corrective actions	11-8-90
Soil and debris contaminated with California list HOCs *not* from CERCLA response actions or RCRA corrective actions	7-8-89
All soil and debris contaminated with first-third wastes for which treatment standards are based on incineration	8-8-90

Source: 53 FR 31197.

TABLE 7.2

SOFT-HAMMER WASTES POTENTIALLY SUBJECT TO CALIFORNIA LIST PROHIBITIONS[1]

RCRA hazardous waste number	Potential California list constituent	RCRA hazardous waste number	Potential California list constituent
F006	Cyanides	U029	Halogenated organics
F007	Cyanides	U036	Halogenated organics
F008	Metals	U037	Halogenated organics
F009	Metals	U041	Halogenated organics
K004	Chromium	U043	Halogenated organics
K011	Cyanides	U044	Halogenated organics
K017	Halogenated organics	U046	Halogenated organics
K021	Halogenated organics	U061	Halogenated organics
K031	Arsenic, lead, or mercury	U066	Halogenated organics
K035	Halogenated organics/metals	U067	Halogenated organics
K046	Lead	U074	Halogenated organics
K069	Lead	U077	Halogenated organics
K073	Halogenated organics	U078	Halogenated organics
K085	Halogenated organics and PCBs	U129	Halogenated organics
		U130	Halogenated organics
K086	Halogenated organics and/or metals	U158	Halogenated organics
		U185	Halogenated organics
K106	Mercury	U192	Halogenated organics
P004	Halogenated organics	U209	Halogenated organics
P016	Halogenated organics	U210	Halogenated organics
P036	Halogenated organics	U211	Halogenated organics
P037	Halogenated organics	U226	Halogenated organics
P050	Halogenated organics	U227	Halogenated organics
P058	Halogenated organics	U228	Halogenated organics
P059	Halogenated organics	U237	Halogenated organics
P123	Halogenated organics		

[1]Although provided by EPA, this table should be considered nonbinding guidance, i.e., EPA does not claim that other soft-hammer wastes will never be California-list wastes.

Source: McCoy and Associates, Inc., adapted from 53 FR 31175 and 31187.

The preamble to the first-third rule identified the soft-hammer wastes that might also be California list wastes; this information is presented in Table 7.2. In general, California list wastes contain heavy metals, cyanides, PCBs, acids, or halogenated organics. If a waste is both a first-third waste and a California list waste, the following regulatory hierarchy applies:

- If a treatment standard has been developed for a first-third waste (Table 6.3), the treatment standard, when effective, supersedes the California list prohibitions. This follows agency policy that the more specific and the more stringent requirements apply if an overlap exists between different restrictions.
- Soft-hammer wastes that are also California list wastes (Table 7.2) are subject to the California list prohibitions. Depending on whether the California list prohibitions include a treatment standard in 40 *CFR* Part 268.42, the soft-hammer prohibitions may also apply. At the present time, only PCBs ≥ 50 ppm and liquid and nonliquid halogenated organic compounds (HOCs) ≥ 1,000 mg/kg are subject to treatment standards in §268.42. For soft-hammer wastes that fall under these three categories, only the California list prohibitions apply. The practical effect of this distinction is that treatment residues can be disposed in nonminimum technology landfills and impoundments. For all other California list wastes, (*i.e.*, those without treatment standards in §268.42) the waste or treatment residue must meet the California list prohibition levels *and* the soft-hammer prohibitions.

The preamble gives the following example: A soft-hammer, first-third waste is corrosive with a pH

< 2.0; thus, it is also a California list waste. No California list treatment standard has been promulgated in §268.42 for corrosive wastes. Therefore, before land disposal, the waste must be treated so that it is no longer corrosive (or is nonliquid) — these are California list requirements. The waste is also subject to the soft-hammer prohibitions; hence, the waste or treatment residue, if disposed in a surface impoundment or landfill, may only be placed in units meeting minimum technological standards. A certification that no further practically available treatment exists must also be made.

Figure 13 in Chapter 3 presents the logic that will make it easier to resolve overlaps between first-third wastes and California list wastes. Figure 14 presents logic that will be helpful in resolving other types of regulatory overlaps.

RESIDUES FROM TREATING RESTRICTED HAZARDOUS WASTES

The "derived-from rule" [40 *CFR* 261.3(c)(2)] essentially states that residues derived from the treatment, storage, or disposal of a listed hazardous waste are considered to be the same listed waste. Thus, if a treatment standard has been developed for a listed waste, any residue generated from treatment of that waste must also meet the treatment standard.

Treatment residues from restricted wastes must continue to be treated until they meet the treatment standard unless the residue falls into a different treatability group. The following examples clarify this point:

- If a wastewater containing < 10,000 mg/L of HOCs produces a treatment residue with ≥ 1,000 mg/L of HOCs, the residue must be treated until it meets the 1,000 mg/L limit. However, if the residue contains ≥ 10,000 mg/L HOC, further treatment of the residue would not be required. This apparent contradiction occurs because EPA has determined that incineration must be used to treat wastes containing ≥ 10,000 mg/L HOCs. Since there is inadequate nationwide incineration capacity, the prohibition doesn't take effect until November 8, 1988.

- If an incinerator burns an F001-F005 spent solvent containing ≥ 1% total F001-F005 solvent constituents and generates a scrubber water containing < 1% total organic carbon, this scrubber water belongs to a different treatability group, i.e., the spent solvent wastewater treatability group. If the scrubber water contains F001-F005 spent solvent constituents in concentrations < 1% but greater than the applicable treatment standards, further treatment of the scrubber water would not be required until November 8, 1988.

- Where a wastewater is decanted from restricted spent solvents, and the wastewater contains < 1% TOC but F001-F005 solvents are above the applicable treatment standards, the wastewater is in a different treatability group than the original spent solvents. It would not be subject to the land disposal restrictions until November 8, 1988.

If a waste is initially determined by the generator to be subject to a variance (*e.g.*, a nationwide extension to the effective date) any treatment residue from the waste is also subject to the variance. (This occurs because the point of generation determines whether a waste is prohibited.) For example:

- A waste containing ≥ 10,000 mg/L HOC is subject to a variance until November 8, 1988. If this waste is treated and a wastewater residue containing < 10,000 mg/L HOC is produced, the residue is also subject to the variance.

- Spent solvents from small quantity generators (100-1,000 kg/mo) are subject to a variance until November 8, 1988. Any residue resulting from the treatment of this waste would also be exempt from the land disposal restrictions.

The procedures to be used in applying the land disposal restrictions to treatment residues are covered in Figure 12 of Chapter 3.

LEACHATES

Leachates from both active and inactive land disposal units raise particular problems for the land disposal restrictions. If a leachate is produced from contact of water with a hazardous waste, the leachate is considered to be the same hazardous waste as the original waste by operation of the derived-from rule. Therefore, leachates are subject to the land disposal restrictions for the listed wastes from which they are derived if the leachates are managed actively after the effective date of the applicable land disposal restriction.

Owners/operators of inactive land disposal units have been concerned that managing leachates from inactive units that were never required to have a RCRA permit could make them subject to RCRA permitting requirements. However, EPA has stated that collection of hazardous waste leachate at inactive units that only received wastes before the RCRA regulations first became effective (November 19, 1980) does not activate the unit. Hence, collection of hazardous waste leachate at these inactive units does not require a RCRA permit. Depending on how the leachate is treated, the treatment activities could require a permit; however, even this can be avoided by managing the leachate in tanks at facilities subject to regulation under the Clean Water Act [40 *CFR* 264.1(g)(6)]. Alternatively, if nonhazardous, the leachate can be delisted.

Another concern has been that some land disposal units only received hazardous wastes that were exempt from regulation, yet the leachate from these units could conceivably be considered a hazardous waste via opera-

tion of the derived-from rule. However, EPA's position is that if a disposal unit such as a Subtitle D municipal landfill only received hazardous wastes that were exempted from regulation (*e.g.*, small quantity generator wastes or household wastes), leachate from the landfill is not a hazardous waste. These exemptions are interpreted as applying "cradle-to-grave"; hence, the residues from managing the waste retain the exemption or exclusion.

Leachates from Soft-Hammer Wastes Get Special Consideration

Leachates from first-third wastes pose a unique regulatory problem. Normally, these leachates would be subject to the same restrictions as the original waste. Since no treatment standards have been developed for most of the first-third wastes, leachates (or contaminated ground water) from these wastes could not be placed in impoundments not meeting minimum technological standards, *i.e.*, the soft-hammer restrictions would be applicable. This causes a problem because treatment of these leachates or ground waters would be prohibited in units such as unlined biological treatment impoundments.

Since treatment of the dilute wastes in such unlined impoundments might be appropriate, EPA has reclassified the leachate and ground water to the third-third list. This avoids the soft-hammer prohibitions of the first-third wastes. The reclassification applies to "leachate derived from the treatment, storage, or disposal" of first-third, soft-hammer wastes (Table 6.2) and to "contaminated ground water that contains such wastes."

For example, a leachate is derived from disposal of both soft-hammer, first-third wastes (Table 6.2) and first-third wastes for which treatment standards have been established (Table 6.1). Before the leachate can be placed in an impoundment not meeting minimum technological standards, it must comply with the treatment standards for the nonsoft-hammer wastes. Once this is achieved, it can be placed in an impoundment that does not have double liners, even if no treatment has been applied to the constituents from the first-third, soft-hammer wastes.

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